



# Feasibility of Digitizing LEI Evaluations with an Internationalized ASSISTments



Bryce Kaw-uh



# The Latino Education Institute (LEI)

## The Purpose

---

Aims to “improve the academic achievement and well-being of Latino students (grades K-16) and their families” (“About LEI”)

## The Impact

---

Runs 19 community programs that serve 16 schools and 2,800+ families

## The Challenge

---

Needs a multilingual online platform to streamline its student evaluation process

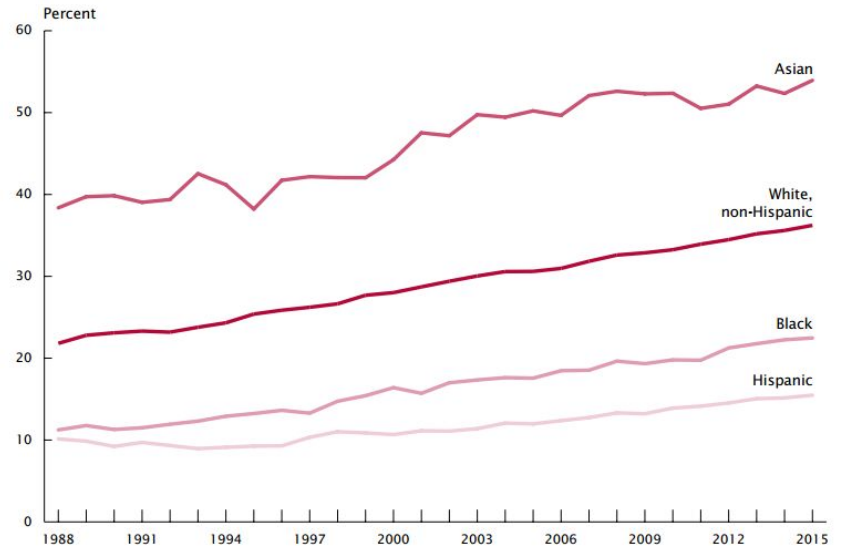


Latino Education Institute

# Barriers to an Equal Education

- The Latino achievement gap is the product of an education debt
- Contributing factors:
  - Systemic discrimination
  - Poverty
  - Language differences
  - Lower school funding

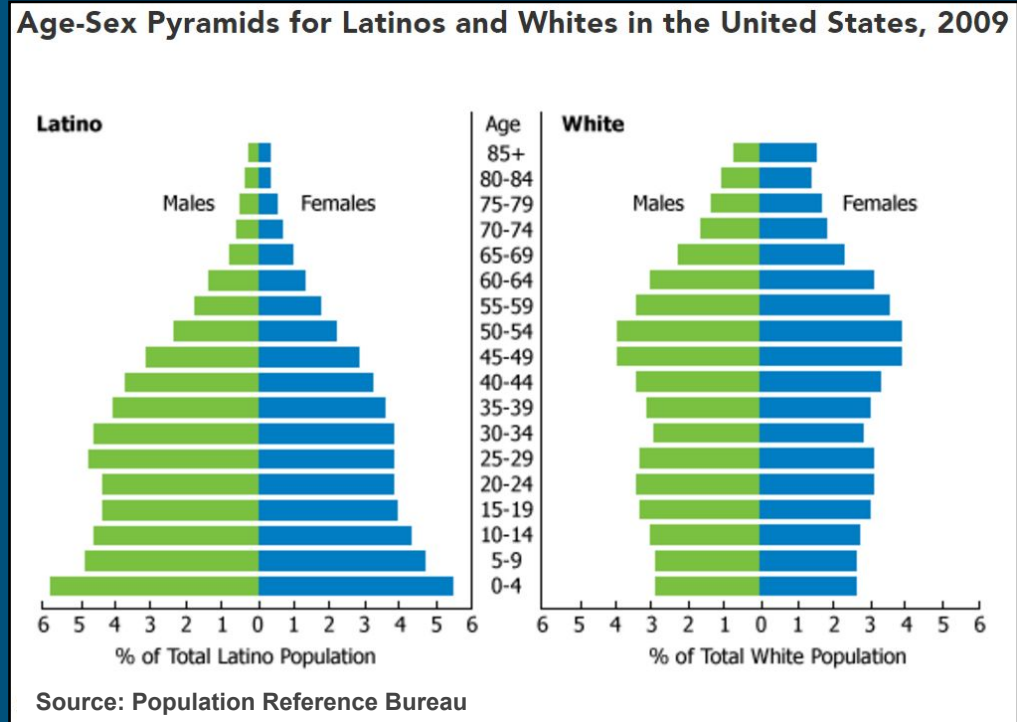
Figure 3.  
**Percentage of the Population 25 Years and Older With a Bachelor's Degree or Higher by Race and Hispanic Origin: 1988 to 2015**



Source: U.S. Census Bureau, 1988–2015 Current Population Survey.

# Closing the Gap: Important yet Complex

- 24.3% of children attending elementary and high school self-identified as Latino in 2015
- Latinos are not a monolith:
  - Mexican: 63.4%
  - Puerto Rican: 9.5%
  - Salvadoran: 3.8%
  - Cuban: 3.7%
  - Dominican: 3.3%
  - Guatemalan: 2.4%



41%

of Worcester Public Schools students self-identified as Latino in 2016

# WPS High School Graduation Rates



Asian

84.8%



White

78.2%



Black

76.5%



Latino

67.4%

# The Latino Education Institute (LEI)

## The Purpose

---

Aims to “improve the academic achievement and well-being of Latino students (grades K-16) and their families” (“About LEI”)

## The Impact

---

Runs 19 community programs that serve 16 schools and 2,800+ families

## The Challenge

---

Needs a multilingual online platform to streamline its student evaluation process



Latino Education Institute

# ASSISTments

## The Purpose

---

Aims to, “in classrooms everywhere, continuously improve teaching and learning through the use of validated educational research findings and applied technology” (“ASSISTments Mission and Vision”)

## The Impact

---

Helps more than 600 teachers create online quizzes and assignments

Used in 42 states and 14 countries

## The Challenge

---

Needs internationalization in order to expand its global presence



**ASSISTments**™  
A Free Public Service of Worcester Polytechnic Institute



# Internationalization

---

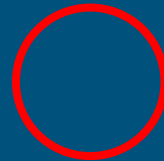
- Definition:

“The process of planning and implementing products and services so that they can easily be adapted to specific local languages and cultures, a process called localization” (“What is internationalization (I18N)?”).

Hello!



¡Hola!



# Two Challenges, One Solution?

## LEI

---

A non-profit educational organization that needs a multilingual online platform to streamline its student evaluation process

## ASSISTments

---

An online educational platform that needs internationalization in order to expand its global presence



Digitizing LEI Evaluations with an Internationalized ASSISTments

# Goal

Address both issues at once by internationalizing ASSISTments and determining whether it was the optimal service for digitizing LEI's evaluations

# Methodology

Determining Requirements

Software Changes

Alternative Platform Reviews

Informal Walkthroughs

Student Pilot Programs

Final Deliverables

---

# Methodology

## Determining Requirements

Software Changes

Alternative Platform Reviews

Informal Walkthroughs

Student Pilot Programs

Final Deliverables

---

# Determining Requirements

---

- Collected from in-person interviews and email correspondence with LEI Assistant Director Hilda Ramirez

<i>System Requirements</i>	
✓	Free Institutional Usage
✓	Free Technical Support
✓	Multilingual Capabilities
✓	Custom Content Creation
✓	Shareable Content
✓	Long-Term Storage
✓	Pre-Processed Data
✓	Exportable Data
✓	Multiplatform Support

# Methodology

Determining Requirements

**Software Changes**

Alternative Platform Review

Informal Walkthroughs

Student Pilot Programs

Final Deliverables

---

# Software Changes: String Translation

	A	B	C	D	F
5	<b>English</b>	<b>Spanish</b>	<b>Arabic</b>	<b>Renah's Arabic Edit</b>	<b>French</b>
6	Answer recorded. Click "Next Problem"	Respuesta registrada. Haga clic en "Siguiente Problema"	تم تسجيل الجواب، انقر (المسألة التالية)		Réponse enregistrée, cliquez sur "Problème suivant"
7	Sorry, try again	Lo sentimos, intente de nuevo	اسف، المرجو المحاولة مجددا	اسف، حاول مرة أخرى	Désolé, veuillez réessayer
8	is not correct	no es correcto	ليس صالحا	غير صحيح	n'est pas correcte
9	Your response	Su respuesta	جوابك		Votre réponse
10	Canceling...	Cancelando...	الغاء		Annuler...
11	Done!	¡Terminado!	تم	تم	Terminé...
12	Downloading...	Descargando...	تنزيل	تنزيل...	Téléchargement...
13	Loading...	Cargando...	جار التحميل	جار التحميل...	Chargement...
14	Uploading your progress...	Subiendo su progreso...	تحميل التقدم المحرز	تحميل التقدم...	Téléchargement de votre progrès...
15	Uploading...	Subiendo...	تحميل	تحميل...	Téléchargement...
16	Working...	Trabajando...	يحمل	يحمل...	Travaillant...
17	Removing old assignment...	Borrando su tarea anterior...	تطبخ الواجبات القديمة	تطبخ الواجبات القديمة...	Supprimer l'ancien devoir...
18	Clearing assignments from your browser	Borrando asignaciones de su navegador	مسح الواجبات من المتصفح	مسح الواجبات من المتصفح	Effacer les devoirs de votre navigateur
19	You must enter an answer.	Debe escribir una respuesta	ادخال الجواب اجباري	يجب ادخال إجابة...	Il faut entrer une réponse.
20	Sorry, your response was incorrect.	Lo sentimos, su respuesta fue incorrecta.	اسف، جوابك غير صحيح	اسف، جوابك غير صحيح...	Désolé, votre réponse n'est pas correcte
21					
22	Type your answer below:	Escriba su respuesta a continuación:	اكتب اجابتك اسفله	اكتب اجابتك تحت:	Tapez votre réponse ci-dessous
23	The problem expects a numeric answer (ex: 3.1, 5, 2/3 or 1 2/3).	El problema espera una respuesta numérica (como 3.1, 5, 2/3 o 1 2/3).	المسألة تتطلب اجابة رقمية (مثل: 3.1, 5, 2/3 أو 1 2/3)	المسألة تتطلب اجابة رقمية (مثل: 3.1, 5, 2/3 أو 1 2/3)	Le problème s'attend à une réponse numérique (par exemple : 3,1,5,2/3 ou 1 2/3)
24	The answer "{0}" is not a valid answer. It must be changed.	La respuesta "{0}" no es una respuesta válida. Debe ser cambiada.	"{0}" ليس بالإجابة الصحيحة. يجب تغييرها.	الجواب "{0}" غير صالح، يجب تغييره	La réponse "{0}" n'est pas une réponse valide. Elle doit être changée.
25	The problem expects a numeric expression for an answer (ex: 3 - 2*4, or 2/3).	El problema espera una expresión numérica como respuesta (como 3 - 2*4, o 2/3).	المسألة تتطلب تعبيراً رقمياً كإجابة (مثل: 3 - 2 * 4 أو 2/3).		Le problème attend une expression numérique pour une réponse (ex: 3 - 2 * 4 ou 2/3).
26	Uh oh, parentheses in your answer are not matching in pairs.	Uh oh, los paréntesis en su respuesta no coinciden en parejas.	أه أو، الأقواس في اجابتك ليست متطابقة كأزواج.	الأقواس في اجابتك ليست متطابقة كأزواج.	Uh oh, les parenthèses de votre réponse ne correspondent pas par paires.



# Software Changes: Outcome

ASSISTments

Profesor(a)

**Estudiante**

Constructor

Cuenta

Bryce Kaw-uh (bckawuh@wpi.edu) [Cerrar sesión](#)

Tareas

Configuración

Más información

Problemas completados: 0/6

← How long do Bach...

Tarea: 4 - Model LEI Evaluation

ID del problema: PRABC8WE

[Comente acerca de este problema](#)

How long do Bachelors degree programs typically last?  
¿Cuánto tiempo duran los programas de licenciatura?

Seleccione uno:

1 year / año

3 year / años

4 year / años

6 year / años

 100% <sup>?</sup>

[\[+\] Puede enviar su trabajo con su respuesta](#)

Enviar Respuesta

Mi trabajo es lo suficientemente bueno para compartir con otros

Mostrar respuesta

# Software Changes: Outcome

The screenshot displays the ASSISTments interface. At the top, the logo "ASSISTments" is on the left, and navigation links "Profesor(a)", "Estudiante", and "Constructor" are in the center. On the right, the user's account information "Cuenta" (Bryce Kaw-uh) and a "Cerrar sesión" link are visible. Below the navigation bar, there are tabs for "Tareas", "Configuración", and "Más información". A sidebar on the left shows "Problemas completados: 0/6" and a link to "How long do Bach...". The main content area is titled "Tarea: 4 - Model LEI Evaluation". It features a problem ID "PRABC8WE" and a question: "How long do Bachelors degree programs typically last? ¿Cuánto tiempo duran los programas de licenciatura?". Below the question is a radio button selection menu labeled "Seleccione uno:" with options for 1, 3, 4, and 6 years. A progress bar on the right shows 100% completion. At the bottom, there are buttons for "Enviar Respuesta" and "Mostrar respuesta", along with a checkbox for "Mi trabajo es lo suficientemente bueno para compartir con otros". A link to "Comente acerca de este problema" is also present.

ASSISTments

Profesor(a) Estudiante Constructor

Cuenta Bryce Kaw-uh (bckawuh@wpi.edu) Cerrar sesión

Tareas Configuración Más información

Problemas completados: 0/6

How long do Bach...

Tarea: 4 - Model LEI Evaluation

ID del problema: PRABC8WE

Comente acerca de este problema

How long do Bachelors degree programs typically last?  
¿Cuánto tiempo duran los programas de licenciatura?

Seleccione uno:

- 1 year / año
- 3 year / años
- 4 year / años
- 6 year / años

100%

[+] Puede enviar su trabajo con su respuesta

Enviar Respuesta  Mi trabajo es lo suficientemente bueno para compartir con otros

Mostrar respuesta

# Software Changes: Outcome

ASSISTments

Profesor(a)

**Estudiante**

Constructor

Cuenta

Bryce Kaw-uh (bckawuh@wpi.edu) [Cerrar sesión](#)

Tareas

Configuración

Más información

Problemas completados: 0/6

← How long do Bach...

Tarea: 4 - Model LEI Evaluation

ID del problema: PRABC8WE

[Comente acerca de este problema](#)

How long do Bachelors degree programs typically last?  
¿Cuánto tiempo duran los programas de licenciatura?

Seleccione uno:

1 year / año

3 year / años

4 year / años

6 year / años

 100% <sup>?</sup>

[\[+\] Puede enviar su trabajo con su respuesta](#)

Enviar Respuesta

Mi trabajo es lo suficientemente bueno para compartir con otros

Mostrar respuesta

# Software Changes: Outcome

ASSISTments

[Profesor\(a\)](#)

**[Estudiante](#)**

[Constructor](#)

[Cuenta](#)

Bryce Kaw-uh (bckawuh@wpi.edu) [Cerrar sesión](#)

Tareas

Configuración

Más información

Problemas completados: 0/6

How long do Bach...

Tarea: 4 - Model LEI Evaluation

ID del problema: PRABC8WE

[Comente acerca de este problema](#)

How long do Bachelors degree programs typically last?

¿Cuánto tiempo d

Seleccione uno:

1 year / año

3 year / años

4 year / años

6 year / años

[\[+\] Puede enviar su tra](#)

Enviar Respuesta

Mi trabajo es lo suficientemente bueno para compartir con otros

Enviar comentario

Comentario general

**Comentario general**

Tengo dificultades con este problema

Me gustó esta pregunta

Aprendí algo de esta pregunta

Error matemático en esta pregunta

Error ortográfico en esta pregunta

La redacción de esta pregunta necesita mejoras

Se necesitan cambios drásticos para esta pregunta

No puedo ver la imagen en esta pregunta

Cancelar

100% ?

Mostrar respuesta

# Methodology

Determining Requirements

Software Changes

**Alternative Platform Reviews**

Informal Walkthroughs

Student Pilot Programs

Final Deliverables

---

# Alternative Platform Review

- Key:
  - 0 = No Fulfillment
  - 1 = Partial Fulfillment
  - 2 = Total Fulfillment

Requirement	Web Service					
	ASSISTments	Blackboard	Canvas	Google Forms	Moodle	Qualtrics
Free Institutional Usage	2	0	0	2	2	0
Free Technical Support	2	2	2	2	2	2
Multilingual Capabilities	1	2	2	1	2	2
Custom Content Creation	2	2	2	2	2	2
Shareable Content	2	2	2	2	1	2
Long-Term Storage	2	2	2	2	2	2
Pre-Processed Data	1	2	1	2	1	2
Exportable Data	2	2	2	2	2	2
Multiplatform Support	2	2	2	2	2	2
<b>Total</b>	<b>16</b>	<b>16</b>	<b>15</b>	<b>17</b>	<b>16</b>	<b>16</b>

# Alternative Platform Review

- Key:
  - 0 = No Fulfillment
  - 1 = Partial Fulfillment
  - 2 = Total Fulfillment

		Web Service					
		ASSISTments	Blackboard	Canvas	Google Forms	Moodle	Qualtrics
Requirement	Free Institutional Usage	2	0	0	2	2	0
	Free Technical Support	2	2	2	2	2	2
	Multilingual Capabilities	1	2	2	1	2	2
	Custom Content Creation	2	2	2	2	2	2
	Shareable Content	2	2	2	2	1	2
	Long-Term Storage	2	2	2	2	2	2
	Pre-Processed Data	1	2	1	2	1	2
	Exportable Data	2	2	2	2	2	2
	Multiplatform Support	2	2	2	2	2	2
		<b>Total</b>	<b>16</b>	<b>16</b>	<b>15</b>	<b>17</b>	<b>16</b>

# Alternative Platform Review

- Key:

- 0 = No Fulfillment
- 1 = Partial Fulfillment
- 2 = Total Fulfillment

Requirement	Web Service					
	ASSISTments	Blackboard	Canvas	Google Forms	Moodle	Qualtrics
Free Institutional Usage	2	0	0	2	2	0
Free Technical Support	2	2	2	2	2	2
Multilingual Capabilities	1	2	2	1	2	2
Custom Content Creation	2	2	2	2	2	2
Shareable Content	2	2	2	2	1	2
Long-Term Storage	2	2	2	2	2	2
Pre-Processed Data	1	2	1	2	1	2
Exportable Data	2	2	2	2	2	2
Multiplatform Support	2	2	2	2	2	2
<b>Total</b>	<b>16</b>	<b>16</b>	<b>15</b>	<b>17</b>	<b>16</b>	<b>16</b>



# Methodology

Determining Requirements

Software Changes

Alternative Platform Reviews

**Informal Walkthroughs**

Student Pilot Programs

Final Deliverables

---

# Informal Walkthroughs

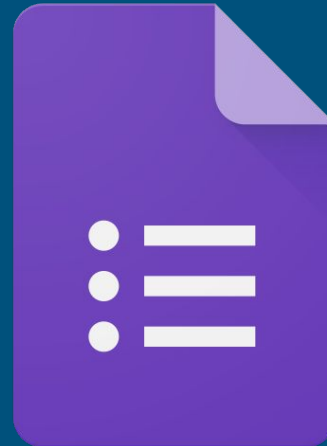
---

- Conducted with LEI Assistant Director Hilda Ramirez

ASSISTments on March 27th



Google Forms Next Week



# Methodology

Determining Requirements

Software Changes

Alternative Platform Reviews

Informal Walkthroughs

**Student Pilot Programs**

Final Deliverables

---

# LEI Student Pilot Programs

## Group 1: March 28

---

**Who:** 8 female LEI high school students

**What:** Completed a model LEI evaluation on ASSISTments and discussed the experience

**Where:** Computer Lab at WSU

**Why:** Learn what LEI students think of ASSISTments when used in practice

## Group 2: April 25

---

**Who:** 1 male and 6 female LEI high school students

**What:** Completed a model LEI evaluation on both ASSISTments and Google Forms and discussed the experience

**Where:** Computer Lab at a WSU

**Why:** Gain a different perspective than Group 1 and learn which platform LEI students prefer

# Methodology

Determining Requirements

Software Changes

Alternative Platform Reviews

Informal Walkthroughs

Student Pilot Programs

**Final Deliverables**

---

# Next Steps

Second Student Pilot Program

Staff Training Resources for LEI

Internationalization Tutorial Video

Recommendations for ASSISTments

---

# Next Steps

## **Second Student Pilot Program**

Staff Training Resources for LEI

Internationalization Tutorial Video

Recommendations for ASSISTments

---

# Next Steps

Second Student Pilot Program

**Staff Training Resources for LEI**

Internationalization Tutorial Video

Recommendations for ASSISTments





# Next Steps

Second Student Pilot Program

Staff Training Resources for LEI

**Internationalization Tutorial Video**

Recommendations for ASSISTments

---

# Next Steps

Second Student Pilot Program

Staff Training Resources for LEI

Internationalization Tutorial Video

**Recommendations for ASSISTments**

---

# Improved Assignment Report

---

Download Report to: [Spreadsheet](#)

PRABC5Y4	PRABC5Y5
	100%
0	1
<p>D</p>	Yes / SÃ-

# Additional Languages

---

Deutsch  
Französisch  
Griechisch  
Italienisch  
Japanisch  
Koreanisch  
Portugiesisch  
Russisch  
Spanisch  
Türkisch  
Vietnamesisch  
Chinesisch  
Indonesisch  
Malayisch  
Arabisch  
Hebräisch  
Hindi  
Sinhalesisch  
Urdu  
Bengalisch  
Punjabisch  
Tamil  
Telugisch  
Kannadisch  
Malayalam  
Sanskrit  
Sinhalesisch  
Tamil  
Telugisch  
Kannadisch  
Malayalam  
Sanskrit

# Further Internationalization

---

- Numbers

1,000.50

1.000,50

- Time of day

1:45 PM

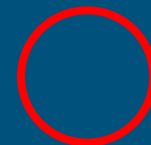
1345

- Date

05-10-16

10-05-16

- Symbols



# Acknowledgements

Professor

Aarti S. Madan

Professor and ASSISTments Co-Founder

Neil T. Heffernan

ASSISTments Team Members

Cristina Heffernan, Christopher Donnelly,  
David Magid, Ilyas Azzoui, and Renah Razzaq

LEI Assistant Director

Hilda Ramirez

WPI Spanish Tutor

Andrea Bayas

---

**Thank You**

---

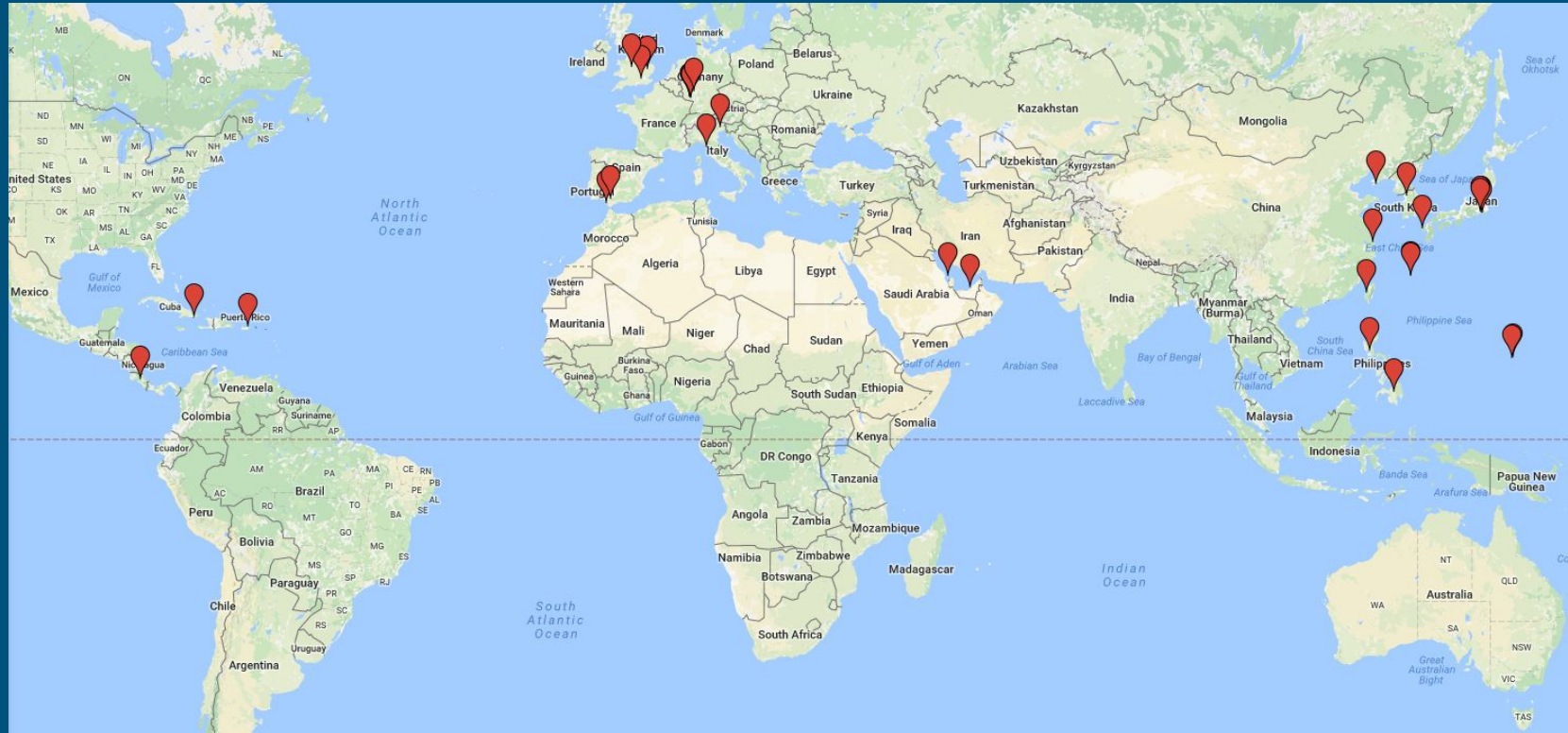
**Any Questions?**

# Map of U.S. Schools Using ASSISTments





# Map of Global Schools Using ASSISTments



# Further Internationalization

---

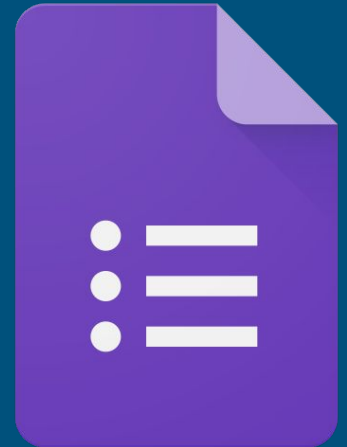
- The specific localization depends on the target audience

User Audience	Language	Symbols	Dates	Numbers
U.S. Latino	✓			
French	✓		✓	✓
Japanese	✓	✓	✓	✓

# Internationalization of Google Forms

---

- Created and maintained by Google
- Language depends on browser setting
- Unknown internationalization of symbols



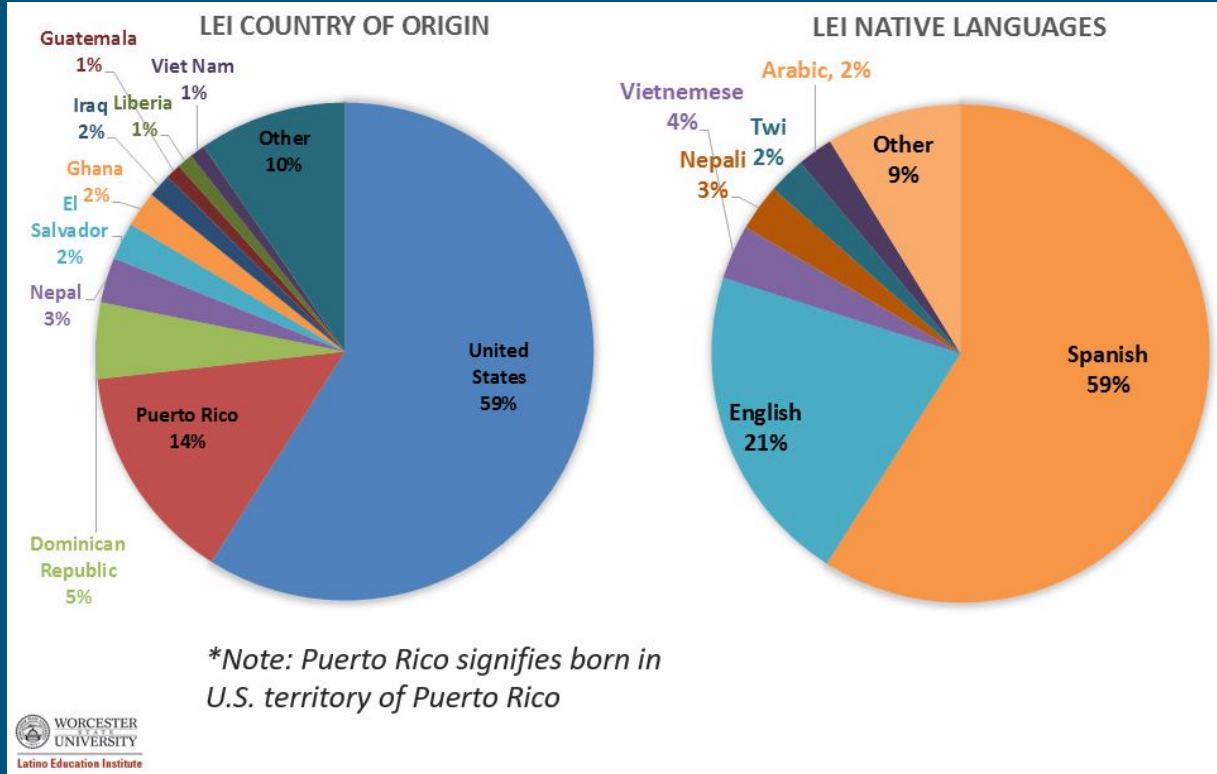
# Ni de aquí ni de allá

---

- The world is increasingly interconnected
- We have the global here in the U.S., and in Worcester
  - “Salad bowl society”
- The Latino achievement gap has transnational origins
  - Socio-political context is necessary for an appropriate response



# LEI Youth Demographics



# Why Not Qualtrics?

---

- LASOS will be receiving access to Qualtrics through WPI faculty
- If faculty contacts disappear, access to Qualtrics disappears
- Long-term data storage is important for LEI



# Software Changes: File Internationalization

```
StudentTutorMessages_es.properties StudentTutorMessages.properties X
1# This is the default StudentTutorConstants properties file. It contains English translations.
2
3# INTERNATIONALIZATION FOR WebApp/gwt/student
4
5# CommentDialog.java
6view_sendComment = Send Comment
7view_typeComment = Type your comment here
8view_cancel = Cancel
9
10# ProgressPanelView.java
11view_problemID = Problem ID:
12view_moreToCome = More to come...
13view_loadingProblem = Loading problem...
14
15# StudentResponsesView.java
16view_myResponses = My responses:
17
18# VerticalMultiContentView.java
19view_assignment = Assignment:
20
21# TutorContentFeedbackCategoryStrings.java
22domain_questionGeneral = General Comment
23domain_questionDifficult = I am having difficulty with this problem
24domain_questionLiked = I liked this question
25domain_questionLearned = I learned something from this question
26domain_questionMath = Math error in this question
```

# Software Changes: File Internationalization

```
StudentTutorMessages_es.properties StudentTutorMessages.properties
1# This is the Spanish StudentTutorConstants properties file. It contains Spanish translations.
2
3# INTERNATIONALIZATION FOR WebApp/gwt/student
4
5# CommentDialog.java
6view_sendComment = Enviar comentario
7view_typeComment = Escribe tu comentario aquí
8view_cancel = Cancelar
9
10# ProgressPanelView.java
11view_problemID = ID del problema:
12view_moreToCome = Más por venir...
13view_loadingProblem = Cargando el problema...
14
15# StudentResponsesView.java
16view_myResponses = Mis respuestas:
17
18# VerticalMultiContentView.java
19view_assignment = Tarea:
20
21# TutorContentFeedbackCategoryStrings.java
22domain_questionGeneral = Comentario general
23domain_questionDifficult = Tengo dificultades con este problema
24domain_questionLiked = Me gustó esta pregunta
25domain_questionLearned = Aprendí algo de esta pregunta
26domain_questionMath = Error matemático en esta pregunta
```



# Software Changes: File Internationalization

```
ApplicationView.ui.xml | AppController.java
586
587     default:
588         throw new IllegalStateException("Unexpected assignment done state: " + finishedState.getDisplayName());
589     }
590
591     presenter.hideTutor();
592
593     // dm: AS-1009
594     // Let's use the same message seen when not in Test Drive.
595     // And add to it the "You are finished previewing this content."
596     if(acs.isPreviewMode())
597     {
598         completedMsg = completedMsg + "<br/><br/> " + StudentTutorMessages.STM.tutor_finishedPreviewing();
599
600         completedMsgBox = mbProvider.getMessageBoxWithButton(StudentTutorMessages.STM.tutor_finished() + " " + title, completedMsg);
601
602         completedMsgBox.setModal(false);
603         completedMsgBox.setGlassEnabled(true);
604         completedMsgBox.center();
605
606     return;
607 }
```

# Software Changes: File Internationalization

```
ApplicationView.ui.xml
161 <g:layer top="2px" height="32px" left="10px" width="145px">
162   <g:HTMLPanel>
163     <g:Image resource="{res.LogoAssistmentsSmall}"/>
164   </g:HTMLPanel>
165 </g:layer>
166
167 <g:layer>
168   <g:HorizontalPanel ui:field="headerTabs"></g:HorizontalPanel>
169 </g:layer>
170
171 <g:layer top="13px" height="30px" right="35px" width="30%">
172   <g:HTMLPanel ui:field="accountInfo">
173     <a href="/account/logout" id="logoutLink" onclick="return confirm('Are you sure?');">
174       <ui:msg key="impl_logout">Logout</ui:msg>
175     </a>
176     <div id="accountName"></div>
177     <a href="/account" id="accountLink">
178       <ui:msg key="view_account">Account</ui:msg>
179     </a>
180
181   </g:HTMLPanel>
182 </g:layer>
```

# Software Changes: File Internationalization

```
StudentTutorMessages.java ✕
1 package org.assistments.gwt.student;
2
3 import com.google.gwt.core.client.GWT;
4
5
6 public interface StudentTutorMessages extends Messages
7 {
8     /// INTERNATIONALIZATION FOR WebApp/gwt/student
9     public static final StudentTutorMessages STM = GWT.create(StudentTutorMessages.class);
10
11     // view/CommentDialog.java
12     String view_sendComment();
13     String view_typeComment();
14     String view_cancel();
15
16     // view/ProgressPanelView.java
17     String view_problemID();
18     String view_moreToCome();
19     String view_loadingProblem();
20
21     // view/StudentResponsesView.java
22     String view_myResponses();
23
24     // view/VerticalMultiContentView.java
25     String view_assignment();
```

# Software Changes: Language Preference

[Account](#) Bryce Kawuh ( [REDACTED] ) [Logout](#)

[Inbox](#) [Preferences](#) [Need help?](#)

**Student Settings**

---

**Tutor Language Selection**

English ▾

[Save Preferences](#) [Restore Defaults](#)

**Student Settings**

---

**Tutor Language Selection**

English ▾

English

Spanish

[Save Preferences](#) [Restore Defaults](#)

**Student Settings**

---

Student settings successfully changed.

**Tutor Language Selection**

Spanish ▾

[Save Preferences](#) [Restore Defaults](#)

# Software Changes: Language Preference

---

/assistments/student/index.html?assignmentID=AS1797092&locale=es&reportUrl=/tutor/report/item\_level/43752?assignment\_id=1797092#

/assistments/student/index.html?assignmentID=AS1797092&locale=en&reportUrl=/tutor/report/item\_level/43752?assignment\_id=1797092#

# References

---

- The Latino Education Institute (LEI):
  - <http://www.worcester.edu/LEI-About/>
  - <http://www.worcester.edu/LEI-Comparative-Impact/>
  - [https://www.worcester.edu/uploadedFiles/Website\\_Assets/Documents/LEI/LEI-a%20year%20in%20review%20booklet%202015-16.pdf](https://www.worcester.edu/uploadedFiles/Website_Assets/Documents/LEI/LEI-a%20year%20in%20review%20booklet%202015-16.pdf)
- An Unpaid Debt:
  - <https://www.census.gov/content/dam/Census/library/publications/2016/demo/p20-578.pdf>
  - <http://www.prb.org/Publications/Reports/2010/latinosupdate1.aspx>
- 41%:
  - <http://profiles.doe.mass.edu/profiles/student.aspx?orgcode=03480000&orgtypecode=5>
- WPS High School Graduation Rates:
  - <http://www.worcester.edu/LEI-Research-and-Publications/>
- ASSISTments:
  - <http://www.aboutus.assistments.org/mission-and-vision.php>
- Internationalization:
  - <http://whatis.techtarget.com/definition/internationalization-l18N>
- Map of U.S. Schools Using ASSISTments:
  - <https://www.google.com/maps/d/viewer?mid=1xTAh0ByRLgTkTRJNh0dTdfesIVs>
- Map of Global Schools Using ASSISTments:
  - <https://www.google.com/maps/d/viewer?mid=1GmZ4xgutx-dG1IW8iU3JxJUXBtw>